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Early Warning Airship Program On The Rise

Grumman joins Westinghouse-led team in program to enhance Navy's airborne radar vision

Grumman recently signed a $35 million contract with Westinghouse to put an E-2C Hawkeye target detection and tracking system into an airship.

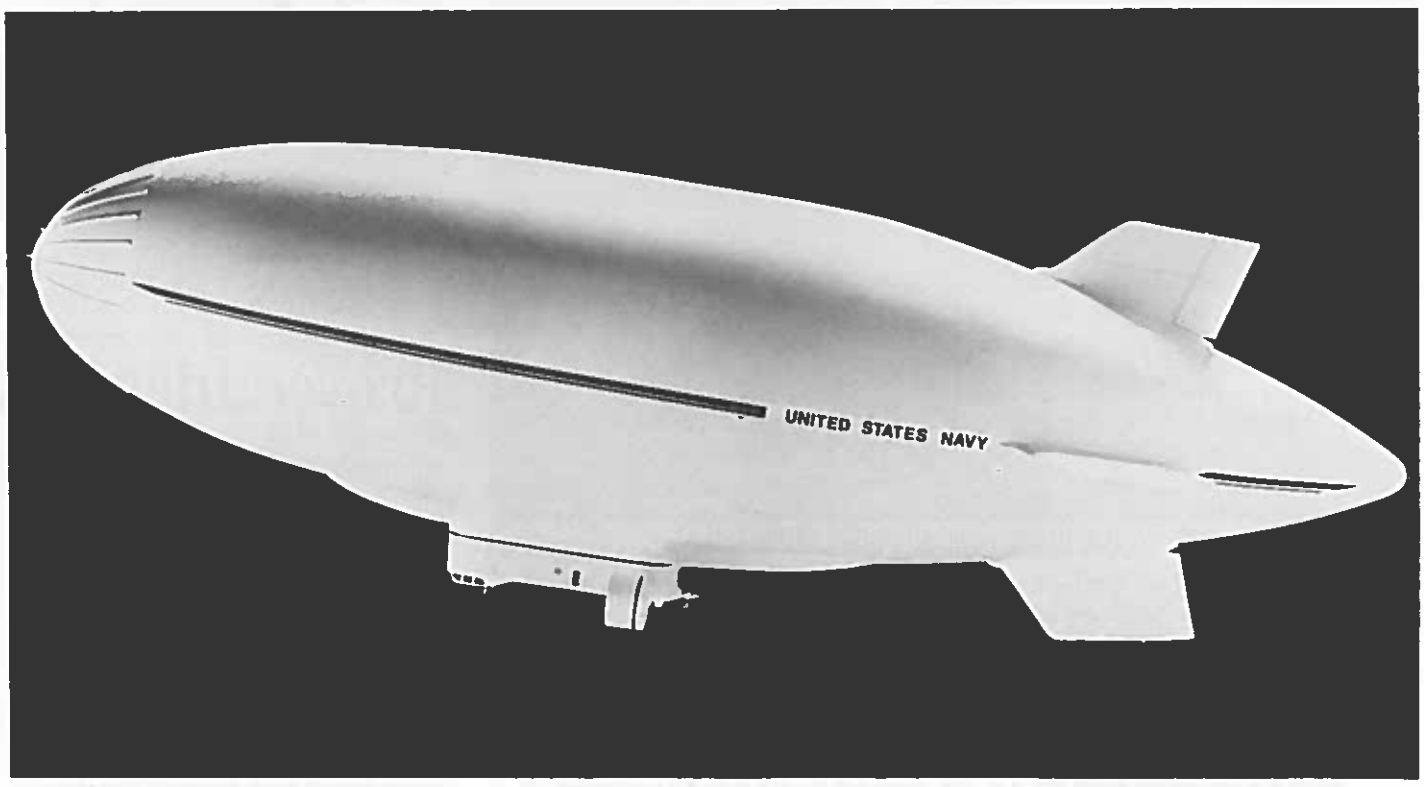
Westinghouse Airship Industries, a joint venture between Westinghouse and Airship Industries Ltd., is the prime contractor on the U.S. Navy's Airship Program which will test the feasibility of using airships in the airborne early warning role. Grumman Aircraft Systems Division will work with Westinghouse Defense Electronics Systems Company. The airship is being designed in England and will be built in the United States by Airship Industries.

"Grumman is responsible for the mission systems integration," says Tony Pacia, the project engineer who heads a Grumman team of twenty engineers. "We will install the E-2C's APS-138 radar system — the current production Hawkeye radar — and the full mission avionics."

This includes the three combat information consoles, the IFF (Identify: Friend or Foe) system, the passive detection system and all communication equipment and data links now aboard the Hawkeye.

In addition, Grumman is developing a new, 40-foot long, wide aperture radar antenna as the airship version of the rotating rotodome on top of today's Hawkeyes. The new antenna will be mounted inside the airship's helium-filled fuselage, called the "envelope."

The airship's mission will be essentially the same as the Hawkeye and other airborne early warning (AEW) aircraft. However, it will concentrate on the inner antiair warfare zone. The airship's primary mission will be to detect, track and hand off low flying antiship missiles.



It's What's Inside That Counts. *Grumman is playing an important role in bringing this airborne early warning airship to reality. Grumman engineers in Melville are adapting a production Hawkeye radar system to fit inside the airship's gondola and envelope. This development airship will be twice the size of the Goodyear blimp; a production airship would be even bigger. Its construction will make it relatively invisible to enemy radar. (Photo Courtesy Westinghouse Defense Electronics Systems Company)*

Though slow, an airship can easily keep pace with ships below. While AEW aircraft have the advantage of movement, speed and radar range, their flight time is limited.

"The airship can stay aloft for 30 days at a time," says Pacia. "An elevator system will bring supplies and crew from a support ship."

The crew will live and work inside the gondola, which will be 80 feet long. The airship's gross system weight will be 144,000 pounds. Its envelope will be 425 feet long and 105 feet in diameter. That will make it more than twice as long and nearly three times the diameter of the Goodyear blimp so often seen at major sporting events.

Though large, an airship is relatively invisible to other radars. The skin of the envelope makes the airship a relatively poor radar target.

The Navy has contracted for one research and development airship. The first flight is tentatively scheduled for November 1990. The Navy will flight test the airship for about six months, then put it to work for another 12 to 18 months in actual battle group operations. After that it will decide if the airship can play a role in the AEW mission.

"A production airship would be a larger vehicle with more capabilities," says Pacia. The Westinghouse team will not move directly into a production phase if the Navy decides to go that way. The service plans to hold a competition for that phase.■

Allied Buying South Carolina Facility To Centralize Its Parts Production

COLUMBIA, South Carolina, September 16, 1987 — At a press conference today, Governor Carroll Campbell Jr. and Grumman Allied President Ron Peterson announced that Grumman Allied will purchase a 137,000 square-foot manufacturing plant in Lexington County.

The new plant, formerly the National Twist Drill facility, will help Allied centralize its production and warehousing of parts. From the new plant, the parts will be fed to current manufacturing sites for final assembly.

"Grumman and South Carolina are a perfect match," said the governor. "The company was looking for a skilled labor force and easy access to interstate highways and rail lines, while the state and Lexington County were looking for increased job opportunities with a top-flight company."

"We are pleased to become part of the South Carolina business community," Peterson said. "We have been impressed with the cooperation we received from Gov. Campbell and other state and local officials as we went through the site selection process."

Grumman Allied produces aluminum truck bodies, fire trucks and other emergency vehicles, and aluminum boats. By combining functions in Lexington, Allied will free space at Allied's other sites for current and future products, said Peterson. "We have determined the most cost effective production method for us is to bring rolled aluminum to one plant, shape it and ship extruded aluminum parts to our other five plants for final assembly," Peterson said.

"As you can imagine, this won't all take place overnight — we have been manufacturing truck bodies using current production methods for 31 years. We plan to phase in this operation over a four-year period."

Hiring will begin in October. About 200 people will be hired over the first two years, another 100 in the third year.■

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The Investment Plan Is For Savings, Not Fast Cash

The Grumman Employee Investment Plan is a savings plan with four different funds for long-term investments. However, when withdrawals have to be made, EIP members often ask, "When will I get my check?"

It takes four to five weeks after the end of the month in which you request the check to receive your money.

Unlike banks or credit unions where you can get a withdrawal check right away, the EIP does not have the liquidity to provide this service. "We invest the money for the longer term to obtain higher returns," says Bob Bradshaw, Grumman vice president and secretary. "For instance, the Guaranteed Income Fund currently earns 11 percent compared to about 5.5 percent at banks. In addition, we value the investments once a month to keep the administrative costs down."

As the EIP's recordkeeper, Bankers Trust computes the unit values for each fund every month. It's a complex procedure. The firm collects the information on the value of the investments from the various fund managers, and incorporates the previous month's EIP activities such as transfers, withdrawals and new contributions. The new unit values are then calculated for each fund. After this is done, Bankers Trust can draw a check and mail it to you.

Since the EIP office gets very busy at month's end, you are encouraged to submit your withdrawal request a few days earlier. If you mail your request, allow for mail delays. Any request received after the last day of the month will be processed in the next month's group.■

Unit Values

The Grumman Employee Investment Plan has reported the following unit values as of July 31, 1987 (compared to June 30, 1987 figures):

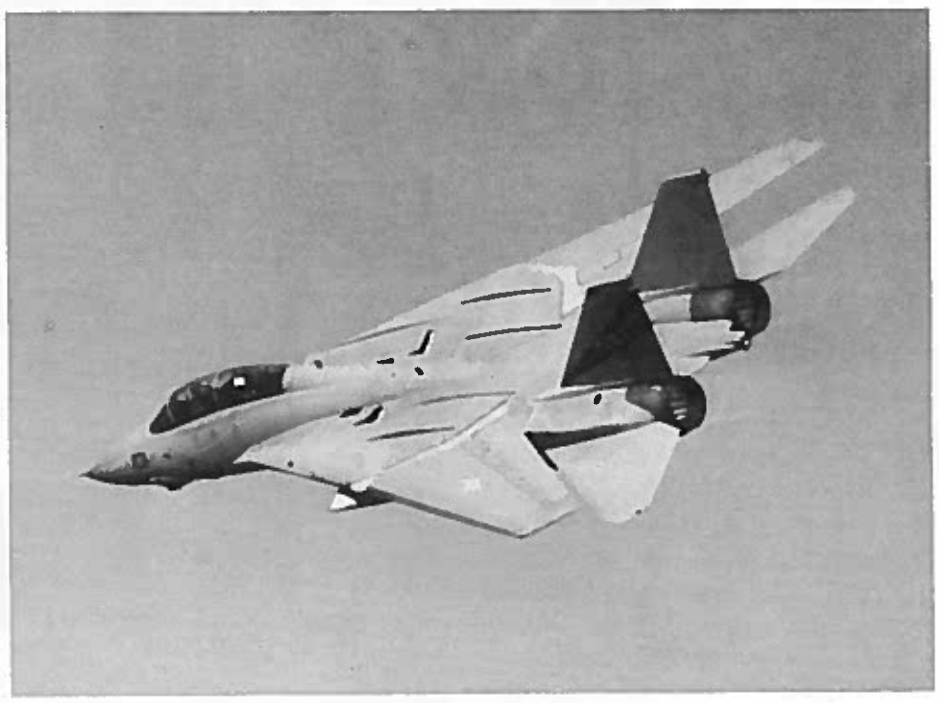
Equity Fund
4.893 up from 4.649

Fixed Income Fund
5.720 down from 5.731

Guaranteed Income Fund
2.558 up from 2.535

Company Stock Fund
$29.75 up from $26.25

Note: It usually takes several weeks to formulate these values. EIP members can call Ext. (111) 54400 (outside Grumman, call 516-575-4400), for a recorded message that is made as soon as the new unit values are available.



In Fighting Form. *The panels with the two aerodynamic beams just behind the wing pivots will soon be made of composite materials. The change will save over 40 pounds.*

Proven Idea Taken Off The Shelf

The Navy has given Grumman the go-ahead to produce production composite overwing fairings for the F-14.

The Grummanites in Milledgeville, Georgia, started work on the program last month and are now building the static and fatigue beam test elements of the composite, aerodynamically shaped beams that go on top of each fairing. Those articles will be delivered towards the end of this year.

Production is scheduled to start in Milledgeville in the beginning of next year. The first delivery will be made to Calverton, Long Island, in September 1988, so the parts can be added onto F-14 No. 579.

They are working under a Value Engineering Change Contract. Value engineering is an effort to cut costs — and lets the contractor and the service share the resulting savings.

The overwing fairings are just aft of the wing pivot hinges. Each fairing is about eight feet long and eight feet wide. They move somewhat when the wing sweeps.

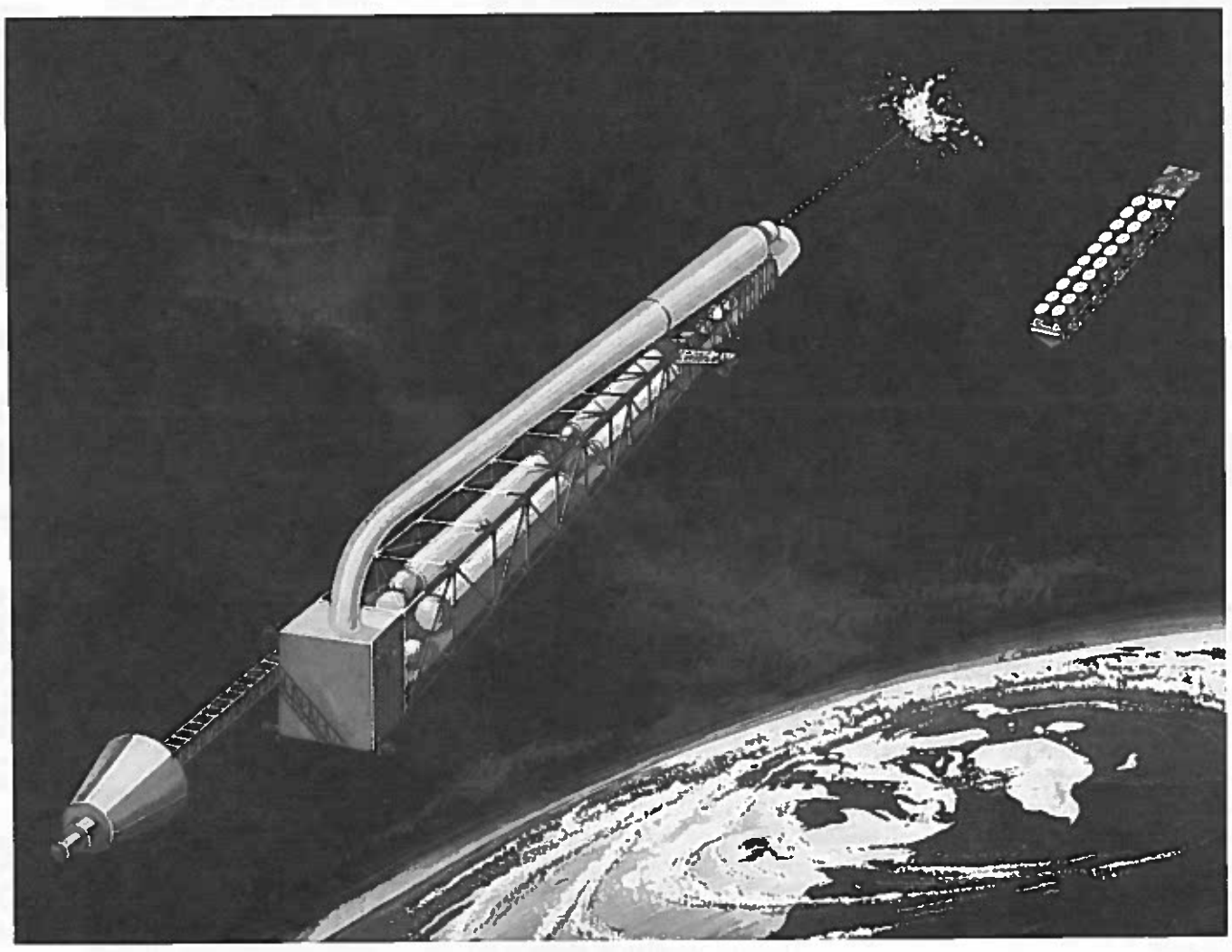
The composite fairings are not a new idea.

"We built five shipsets of boron and graphite epoxy fairings for the Naval Air Development Center about six years ago," says John Roman of Advanced Composites.

Two sets were test flown at Calverton in May, 1977. They were the first graphite epoxy structures to be flown by Grumman. Another set was used during recent F-14 test flights there. The other two shipsets were first flown in 1981 and, over the past six years, have accumulated valuable in-service data while on Navy F-14s at Pt. Mugu, California.

"We had very good service life from them and the Navy wanted to get more composite material onto the F-14 and reduce weight," Roman says. Each set of new fairings will cut 45 pounds from the aircraft's weight.

The current production fairings are made of aluminum skins and stiffened with metal stringers. The new fairings will be made of a hybrid fiberglass and graphite epoxy panel with an aluminum core.■



Space Study. *Neutral Particle Beam weapon platforms are being designed to destroy intercontinental ballistic missiles. The space-based weapon can also discriminate between enemy decoy or real warheads. Grumman is presently under contract to the Army Strategic Defense Command for a conceptual design of the NPB weapon. A proposal for a follow-on Neutral Particle Beam study entitled Advanced Concept Definition and Technology Identification (ACDTI) has recently been submitted to the Army. The ACDTI study is necessary to further assess and evaluate target tracking, platform survivability, communications and booster requirements.*

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Computerized Voice Will Help Pilots Get Out Of Spins

The aircraft is spinning 360 degrees every two seconds and dropping rapidly. If it falls to 10,000 feet the pilot will have to eject and the aircraft will be lost. Disoriented from being swung around as if on the end of a slingshot, the pilot must determine which way the aircraft is spinning so he can correctly begin the recovery procedures he has memorized.

Grumman Aircraft Systems division is developing a voice commanded recovery system that will help prevent a high performance aircraft such as the F-14 or EA-6B from entering into a spin.

Should the plane depart from normal flight, a computer-generated voice is activated and coaches the pilot back to recovery. The voice control system allows the pilot to fly the plane to the edge of its maneuvering envelope and warns him if the aircraft is headed for a departure. "Our pilots and aircraft are not prone to this happening," says test pilot Tom Gwynne. "However, a departure and spin does continue to happen occasionally when an aggressive pilot takes the plane beyond its capabilities. It is a prohibited maneuver that no one gets to practice. A little help during those few seconds before recovery would be very helpful."

There are two kinds of departures that lead to a spin. A high-energy departure is very violent and happens within seconds. A low energy departure happens relatively gradually. Often by the time the pilot is aware of it the plane is approaching a spin.

"In a fully developed F-14 spin the pilot experiences 'six eyeballs out Gs,' " says Gwynne. "If his harness is not locked at the time of the spin, he gets a pretty close up view of the instrument panel. Some pilots have had blood vessels in their eyes break."

Emergency procedures for spin recovery are written in the Navy's flight manual. Pilots memorize and follow them. However, the procedures will work only if the pilot is absolutely sure of the direction of the spin. If the disoriented pilot misjudges the direction, it could only make things worse. The plane may even begin a spin in the opposite direction.

The voice-activated system is programmed to automatically read the direction of the spin and dictate the proper recovery procedures without the pilot having to look at the controls.

"The most important aspect of this system is the ability to prevent the spin in the first place," says Gwynne. "The computer will give verbal warnings when the plane has approached dangerous thresholds in its performance."

Aircraft Systems has submitted a proposal to the Navy for further development of the system. If accepted, it will be installed in the older and new models of the F-14 and EA-6B aircraft.

The cost of implementing the system is expected to be minimal. The sensor equipment needed is already in the planes and the voice box is an off the shelf item.■

A Second Opinion. *Test pilot Tom Gwynne uses an engineering simulator to help design the voice commanded recovery system. The simulator assists pilots in determining how an airplane will respond in different situations — in this case, at what point in the aircraft's performance the system needs to be activated. Modifications can be made to the control laws of the aircraft and then checked. (Photo by Gerry Costello)*

New Florida Engineering Center To Do R&D Work

MELBOURNE, Fla. — Grumman will break ground on October 1 for a new 80,000 square-foot engineering center here.

Occupancy is slated for June of 1988. The center will house 200 people, primarily systems and software engineers who will work on research and development. Grumman expects to hire 150 engineers locally, with 50 more transferring from within the company.

The center will occupy a 12-acre tract at the Melbourne Regional Airport, next to the Grumman Melbourne Systems Division's Integration and Test Facility. That division now has 750 people in the Melbourne area working on the Joint Surveillance Target Attack Radar System (Joint STARS) program, for which it is the prime contractor.

The reputation of Florida's "Space Coast" as a source of engineering talent was a major factor in planning the center for Melbourne.■

Grand Tour. *Vince Calia, lab head—Experimental Fluid Dynamics, demonstrates an aerosol shock tube for Air Force First Lt. Mark Carteaux and Grummanites Tom Emberton and Bob Salzmann. The device is used to study properties of gas/particle mixtures at high temperatures.*

R&D Scores High

Grumman received excellent marks at the independent research and development (IR&D) review, held last week in Grumman Headquarters.

Eighty evaluators attended the review, representing the Navy, Air Force, Army, the Defense Department, and the National Aeronautics and Space Administration. There were 40 briefings about Grumman's research projects and tours of company laboratories, many of which were under construction at the time of the last review in 1984.

"We did what we set out to do," noted Ric Trotta, director of Development Resources, "and that was to get an idea of how the government views our research. We did very well, especially considering that the government has become tougher in its evaluations."

In addition to an overall final score, the evaluators graded each of the projects covered in the review. The scores help determine how much government IR&D funding Grumman will receive in the next three years — and how the company will spend that money.

Next Grumman Lecture Oct. 5

Superconductivity expert Dr. Paul C.W. Chu will be the guest speaker at the next Leroy Grumman lecture. The lecture will be held on Monday, October 5 at 4:30 p.m. in the Grumman Headquarters auditorium.

Dr. Wu's topic will be "The Discovery and Physics of Superconductivity Above 90°K." Dr. Wu, T.L.L. Temple chair of science at the University of Houston, is the director of the team of physicists that made breakthroughs in the science of superconductivity earlier this year.

Scientists have known for many years that at extreme zero (-460°K), some compounds become "superconductors" — there is no resistance to electric current, no heat given off and no energy loss. The low temperatures involved made them impractical, however.

Dr. Wu's team achieved the phenomenon at 98°K and in his lecture he will discuss the new materials used to achieve superconductivity at higher temperatures. Superconductors could have far-flung benefits, including smaller, super-fast computers; efficient energy transmission cables; and safer nuclear power.

The lecture series is named in honor of company founder Leroy Grumman and aims to further his commitment to technical excellence. This will be the last lecture of 1987.

All Grummanites are invited to attend, but you must reserve a seat by calling Mary Mickol at Ext. (111) 53766 or 58770 (516-575-3766 or 8770).

The Chemistry's Just Right Between Grumman, Du Pont

FAYETTEVILLE, N.C. — A polymer products plant here recently became the third Du Pont facility to contract with Grumman Systems Support. A master service agreement between Grumman's computer-maintenance unit and chemical giant Du Pont went into effect on June 1.

The agreement provides Du Pont's 150 plants across the U.S. with the alternative of contracting with a third party computer maintenance provider. "Third-party maintenance" is service provided by a firm other than the manufacturer of the computer equipment.

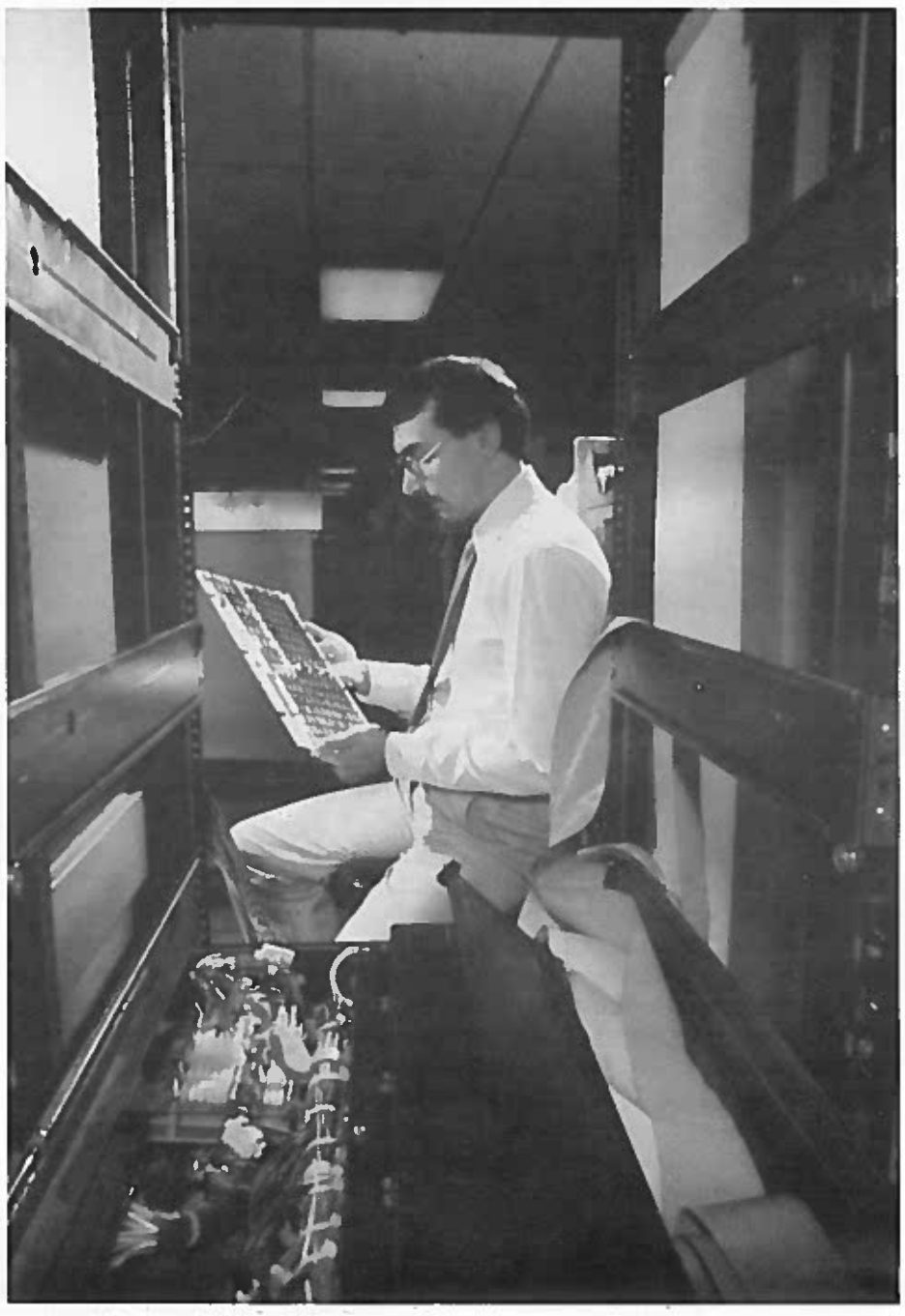
The work in Fayetteville starts on October 15. The other two Du Pont facilities now serviced by Grumman are in Pittsburgh, Pennsylvania, and Chattanooga, Tennessee.

"The signing of the master service agreement is quite an accomplishment," says Carla O'Millian, the Southeastern senior sales representative for Systems Support, who handled the sale. "We spent countless hours presenting Grumman's capabilities to Du Pont and were chosen over a formidable array of competitors — including Control Data, and Honeywell."

Grumman Systems Support has submitted price quotes to service four other Du Pont plants. As the details of the master service agreement reaches them, other Du Pont facilities are contacting Grumman Systems Support, with the most recent being from the Gulf Coast petroleum region.

"Many of Du Pont's computers are used for critical process control applications within the plants," says O'Millian. "It is crucial that the computers stay on-line. Consequently, we are providing on-site field engineers for most of the Du Pont facilities."

O'Millian says the Du Pont contracts assist Grumman Systems Support in its nationwide expansion. "Fayetteville is about an hour south of the Raleigh-Durham area — a high-tech hot spot," says O'Millian. "With a field engineer in Fayetteville, we will be able to explore the numerous other opportunities for expansion in this region."■



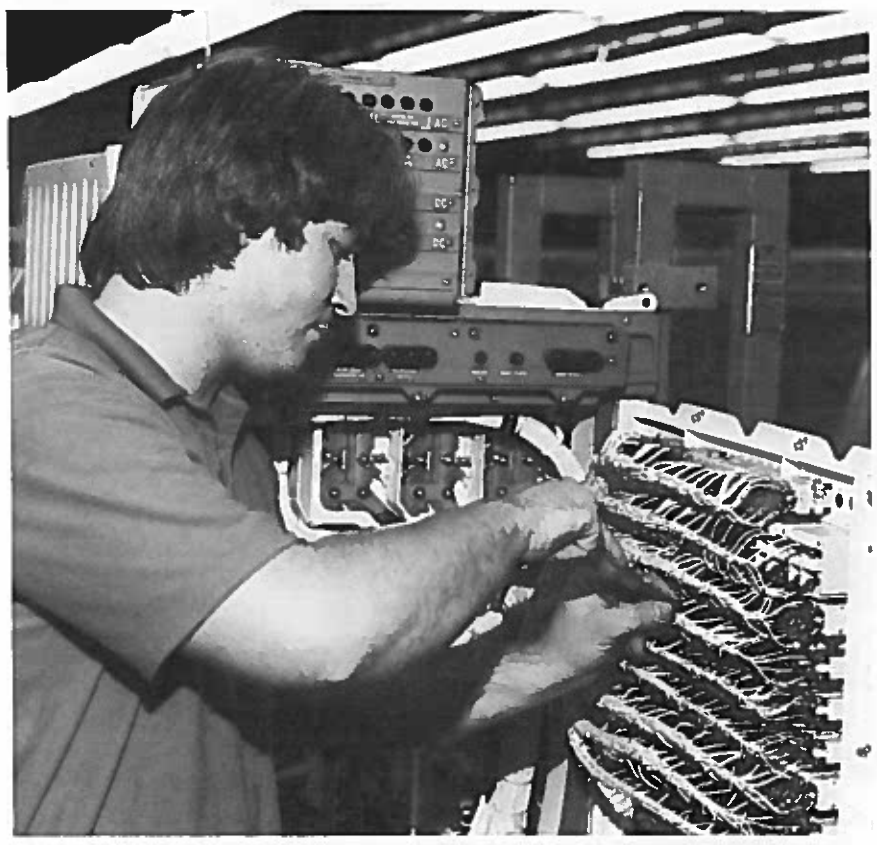
Across The Boards. *Grumman Systems Support has a master service agreement with Du Pont, and now maintains Digital Equipment Corporation (DEC) computers at three of the company's plants. At Systems Support's Woodbury, Long Island, facility, Larry Lala, its director of technical support, checks out a DEC PDP-11 circuit board. (Photo by Rich Breunig)*

Personnel Sponsors Two Fairs

This month, Grumman Personnel will sponsor two fairs for all Grummanites. The Medical Department's annual Health Fair will be held September 28 and 29; the new Dependent Care Fair will take place September 30-October 1. Grummanites can stop by the exhibits from 11:30 a.m. to 4 p.m. each day on the concourse of the headquarters building in Bethpage.

At the Health Fair, representatives of many health organizations will be available to outline the services and programs they offer. Among those who will have booths will be the Suffolk County Respite Care Association, the Sickle Cell Project, American Diabetes Association, and the Multiple Sclerosis Society. In addition, free blood pressure checks will be given.

The Dependent Care Fair will have the American Association of Retired Persons, the Nassau County Department of Senior Citizen Affairs, the Foster Grandparents Association, the Suffolk County Day Care Council and many other organizations on hand.■



'Kitchen Cabinet.' *That's the nickname of the main electrical junction box for the E-2C, which Rick Cooke is working on at Grumman Electronics Systems' Salisbury, Maryland, facility. The box takes about a month to build and goes into the tail section of the aircraft. (Photo by Bob Sagliocca)*

Lightning Doesn't Quite Strike

Mother Nature didn't live up to expectations during flight tests of a Grumman experiment designed to test a lightning flash-sensitive photochromic material.

Herb Kivlighn, a Corporate Research Center scientist, and technician Joe Havranek had built the self-contained experiment to test the new material against flashes of lightning.

During the summer, the experiment flew on the Federal Aviation Administration's Convair 580 flying lab out of Patrick Air Force Base, Florida, where heavy thunderstorms somewhere nearby usually occur daily. Havranek had gone along to run the experiment during its first six flights, then left it for the FAA crew to operate.

"Unfortunately, they didn't get the bad weather they thought they would," says Kivlighn. "When I last talked to Mike Glynn, the FAA project manager, he said they hadn't seen a storm in the area in eight days."

That was before the plane completed its stay at the end of August. There's hope that the FAA found some storms for the experiment since Kivlighn last spoke to them. He'll find out when he retrieves the experiment.

However, this seems like one of those ideas whose time is yet to come. After Kivlighn and Havranek left Florida, the plane did get struck by a bolt of lightning on one flight. The bolt hit the right wing. The experiment faces the left.■

Don't Withhold Your New W-4

The new tax law requires that you submit a new W-4 form to Grumman before October 1, 1987.

If you do not file a new W-4 or the simpler W-4A form by the deadline, Grumman must withhold taxes from wages as if you are either single claiming one withholding allowance or married claiming two allowances — depending on whether you checked the "single" or "married" box on your most recent W-4 on file.

The new W-4A form includes a simple worksheet which will help you determine the number of withholding allowances you should claim. These forms are available at all Employee Services offices; you should mail your Grumman-supplied W-4A or W-4 form as soon as possible to Personnel Records, E09-GHQ.■

First Two Empennages For V-22 Delivered

Grumman has begun delivering empennages for the V-22 Osprey to Boeing Helicopter of Philadelphia, Pennsylvania. The first empennage was shipped from Stuart Operations in Florida on August 12; the second on September 20. The first empennage is for a flight test V-22, the second for static tests.

Grumman Aerostructures Division is part of the Bell Helicopter Textron/Boeing Helicopter team that is building the V-22 Osprey. Now in the middle of a six-year full-scale development program, the V-22 Osprey is an all-composite tilt-rotor aircraft that flies like an airplane and hovers like a helicopter. The aircraft will be used by the Navy, Marines, Army and Air Force. The Navy is the executive service for the V-22 full scale development program.

From August 1987 to April 1988, Grumman will deliver nine empennages to Boeing: one for fatigue tests, one for static tests, one for dynamic fatigue tests and six for flight test aircraft. First flight of the V-22 will take place in June of next year.

Grummanites at Aerostructures' headquarters in Melville, Long Island, designed the V-22 empennage. This tail section includes the horizontal stabilizer, elevator, two vertical stabilizers and rudders. Grumman is also responsible for a section of aft fuselage directly forward of the empennage.

"The empennage is a complex structure," says Bill Brown, V-22 program director. "Except for attachment fittings, control surface hinges and fasteners, the entire unit is made of composites. And it's big — 18.5 feet wide, 11.5 feet high, and nine feet long."

All the composite parts are built at Aircraft Systems' Milledgeville (Ga.) Operations, Grumman's advanced composites facility. Final assembly takes place at Stuart.

"These deliveries mark a significant milestone which was reached after three years of dedicated activities by many Grummanites," says Senior Vice President Tom McGrath, speaking for Aircraft Systems' Product Operations. "We must continue our efforts to improve our performance and remain competitive."

Working with graphite composite structures is a whole new technology for Stuart. Last November, about 25 people at Stuart participated in a week-long special training session to learn how to assemble composite structures.

"Even if people have 30 years of metal fabrication experience, they have to be what I call 'sensitized' to composites," says Brown. "The two are totally different. Composite parts are very lightweight and relatively fragile. You can't just drill a hole in composites like you do with metals. It's a whole new cutting process. The drills used with composites don't even look like a normal drill.

"Graphite is very abrasive," adds Brown. "We usually have water running over the drill bit not only to keep it cool and lubricated but to extend the life of the cutter. Depending on the thickness of the part, you may be able to drill 400 holes in metal, but with composites you may get only five holes out of a drill bit."

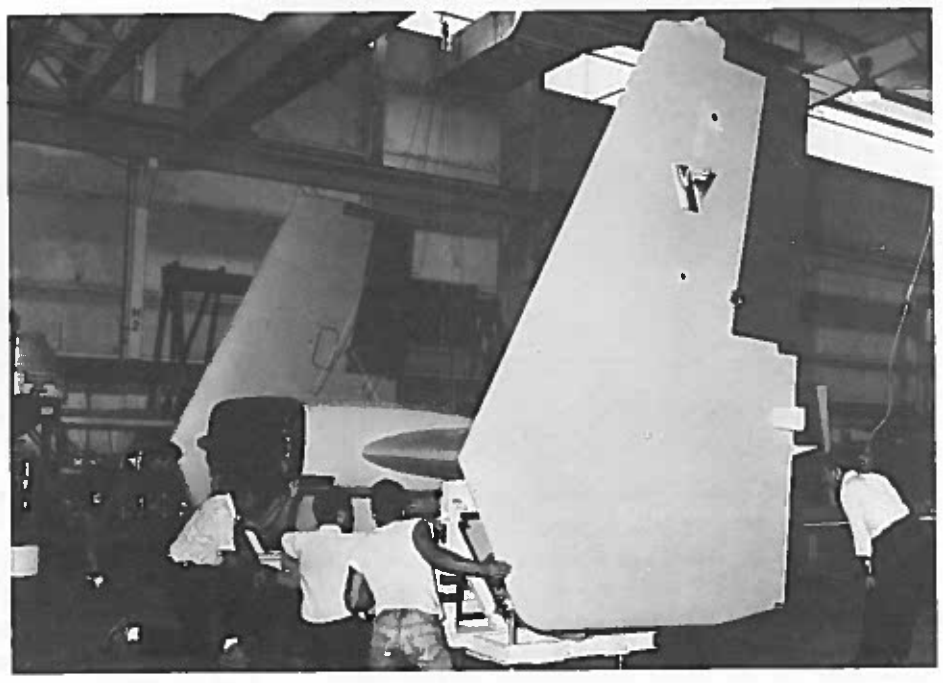
Aerostructures Division President Don Schlegel reports that the Grumman V-22 program is progressing well, but not without the normal problems encountered during any development program. "During a Navy review three weeks ago, we were complimented on our efforts to solve the problems we've encountered. That's what full scale development is all about: finding and fixing problems before production begins," says Schlegel.

The Osprey is the first aircraft being developed under new Department of Defense guidelines for competitive acquisitions. Such programs require competition at every possible level to keep costs down. Even Boeing and Bell could eventually be competing against each other. During the full scale development program, they are building three prototypes each to demonstrate that they can independently deliver aircraft to government specifications.

In June 1988, the Boeing Helicopter Company will issue its requests for proposals to industry for the empennage production contract. The winner will be selected in January 1989. The first production V-22 will be delivered to the Marines in 1991.

Military plans include an initial buy of 913 V-22s. There is also a large potential commercial market for the Osprey after the plane enters military service.

The Marines will receive over 550 Ospreys to carry troops to beachheads from ships far offshore. The Navy plans to use its 50 V-22s for search-and-rescue missions. The Army's 231 Ospreys will be used for utility/medivac and other missions, while the Air Force will use 80 aircraft for search-and-rescue and special operations. The Navy is currently planning on an additional 300 Ospreys for use in the anti-submarine warfare role.■



Easy Does It. *At Stuart Operations in Florida, Grummanites make sure the first V-22 Osprey empennage is ready for shipment to Boeing Helicopter Company in Philadelphia, Pennsylvania. The first V-22 empennage was shipped August 12, the second September 20.*

Personals

My family and I would like to express our thanks and appreciation to all my co-workers, friends and ESO for their kind expressions of sympathy and support during the recent loss of my brother. **Carl Tierno**

My family and I wish to extend our deepest thanks to all my friends, co-workers and ESO for their kind expressions of sympathy and condolence during the recent loss of my beloved mother. **Wilfried Kappus**

I would like to sincerely thank all of my friends and co-workers for their kind expressions of sympathy and support during the recent loss of my mother. **Charlette Durnin**

Power Plant Project Begins To Pick Up Steam

On Monday, September 14, Facilities Engineering began surveying an area just south of Building 5 in Bethpage where a new co-generation plant will be built.

The 50-megawatt electric and steam generating plant is now being designed. It will be constructed, owned and operated by General Electric's Turbine Business Operation, the Brooklyn Union Gas Company and TransCanada Pipelines, Ltd.

Ground breaking is scheduled for the end of next month. "The plan is still to start construction in November and complete the plant in July of 1989," says Bob Kearney, assistant director of Facilities Engineering.

The crew has electronically located existing underground water, electric and other service piping now under the parking area there. The service pipe will have to be relocated before construction can start.

When finished, the plant will provide at least 30 megawatts of electric power to Grumman, with the remainder available to the Long Island Lighting Company. Grumman estimates that the plant will save the company about $3.5 million a year on its electric bill.

As construction progresses, those Grummanites who work in Buildings 2 and 5 and would normally park where the plant will be can find parking behind Building 2, as well as to the north and south of the building. There are also available spots to the east of Building 5.■

Little Margin For Error. *At the Tachonics Corporation, a unit of the Electronics Systems Division, an engineer checks the quality of the circuits built on gallium arsenide. On a wafer of gallium arsenide about the size of a compact disc there could be 2,150 switch circuits. Tachonics is producing gallium arsenide chips for a number of customers. (Photo by Rich Breunig)*

An Interview With Al Verderosa

'I Never Saw The Big Picture Come Back To Bite Anyone; It's Always The Details That Bite You'

Grumman World *recently interviewed Melbourne Systems Division President Al Verderosa as part of its continuing series of interviews with top Grumman officials.*

The Melbourne Systems Division is prime contractor for the Joint Surveillance Target Attack Radar System (Joint STARS). Joint STARS is an Air Force/Army battlefield management system that will detect, locate, track and classify enemy formation at long range. The division is headquartered in Melbourne, Florida, and employs 750 people.

Grumman World: *Melbourne Systems Division is a one-program division right now. What growth do you see for the division?*

Al Verderosa: Right now, we are a one program entity — but it is a very big program. If the full-scale development shows the concept is feasible — and I'm confident it will — Joint STARS will go into production. Conservatively, that could be about 10 aircraft and a $4-5 billion program. Optimistically, it could mean production of 22 to 27 systems with a budget as high as $8-10 billion over a duration of 10 to 15 years. Further sales to NATO is also a distinct possibility.

But we won't just sit pat with Joint STARS. Up to this time, we've chosen not to pursue any new programs because we didn't want to dilute our resources and our people into multiple programs. In the next year, we're going after other C^3I opportunities that are akin, technologically, to what we're doing here.

Joint STARS is a formidable technical challenge. When we complete this program successfully, it will establish our credentials, once and for all, with all the armed services as one of the premier systems designers, integrators and systems test companies in the country.

GW: *What impact did divisionalization have on the Joint STARS program?*

AV: It's made a big difference. Several years ago, when we submitted our proposal for Joint STARS, we recommended that we be set up as a separate division. This was long before divisionalization took place.

As a separate entity, we could reduce our proposal by $150 million. We won the Joint STARS program with a bid of $657 million, so that $150 million was a significant percentage.

Another big advantage to being a separate division is that the Air Force likes it. They are enthralled with the idea that they have their own division doing Joint STARS, that their program has priority and a captive audience. And justifiably so.

GW: *Word has it that the Air Force was a little skeptical about Grumman making the move from Melville, Long Island, to Melbourne, Florida, without a major slip in schedule.*

AV: Lt. Gen. Melvin Chubb, commander of Electronics Systems Command, warned that a company always loses six months when it relocates. We're not new at relocating Grumman families; we did it for the F-14 program in Iran, the hydrofoil, and the X-29. Yet, there was a profound concern about the Joint STARS program, because the development timetable is so tight.

We planned the move the way you would plan a program. We had critical paths detailing who's where. Family relocation seminars were held over four days. Over 200 people attended each night. The seminar featured everything from real estate to school systems to car rentals.

We put a lot of tender loving care into it. We didn't just hand people plane tickets and say, see you at work January 5. Moving is traumatic, so Grumman people were met and personally set up in hotels. One hotel arranged for courtesy buses to take the Grummanites to the building, so their families could have the car. I haven't received a single complaint.

Aside from planning, we had a lot of luck. The contractor finished the building four months ahead of schedule. He decided it was better to complete the project in 1986 to take advantage of the new tax changes.

On December 17 we shut down the computers on Long Island, and spent the next two days packing. We reported for work in Melbourne on January 5 and two days later the computers and everything were up and running. All totalled, we lost about five working days.

'We have made several inroads in software development.'

GW: *How many people relocated?*

AV: Just under 400 people. About 85 percent of those we asked to move did come down. I thought that was a remarkable figure. They moved down quickly and really got on with the job. Only a handful have requested returns, mostly based on missing their children and families.

GW: *Why do you think so many people opted for relocation?*

AV: I have to believe that it was an economic decision. People saw their lifestyle changing for the better.

In addition, there are many opportunities in a small operation like Melbourne Systems. We're starting from scratch and it gives people the chance to get in on the ground floor, build and grow with the organization, and reap the rewards that come with it. From a career standpoint, there's no doubt in my mind that there are opportunities here, because of our smallness and newness. Many of our people have jobs with considerably higher responsibility than they've ever had before.

There are other ingredients. You find an exuberance here. Morale is very high. Being on the ground floor of a new program is always exciting. Combined with the relocation to a new state, it's a new beginning for many people. It's not like moving your office from Building 1 to Building 40.

GW: *Have you hit all the major milestones for Joint STARS so far?*

AV: We haven't changed the original contract, but we have had to redefine many of the milestones. The decision was with the Air Force.

The schedule is very tight and ambitious. We are trying to do things in a shorter amount of time than we normally would on a program of this complexity.

We still have some big challenges ahead of us. Just integrating a system of this complexity is a major challenge. In software alone, we have to develop some 700,000 new lines of code. These are the line-by-line directions for the computers.

'Joint STARS is a formidable technical challenge.'

As for the total system integration, that will involve some two million lines of code.

We have made several inroads in software development. One new software tracking system we are using is called SMARTS — software matrix analysis report tracking system. It helps you track software as if it were hardware. We haven't yet developed the kind of software mentality that we have in hardware programs. For instance, CADAM is used by Grumman engineers to design hardware for aircraft. We are trying to develop a similar computer tool to develop software. It will take time.

GW: *What are the pitfalls?*

AV: Horror stories in software development are well documented and known throughout industry. What happens is that you spend two or three years working on all the requirements, design and coding, and then the unforeseen happens. The system does not work properly. Somewhere along the line, there are software glitches.

Joint STARS has a distributed processing system; it does not have a central processing computer. The processing is handled by several computers located throughout the system. These subsystems handle various tasks and the whole system interacts as one. So, it is very important to understand every function that is required and where each software module will reside. You have to generate a matrix to lay it all out and define the threads between all the subsystems so everyone knows the system from soup to nuts. You have to generate good specs, so the software coders can understand precisely what must be done. It must be done in the beginning stages. You can't patch and fix something later on, because everything plays together. A change in one subsystem could affect another subsystem.

'We track the dickens out of everything.'

Basically what we are doing is building sequentially — one piece and then the next piece.

GW: *Boeing delivered the first E-8A aircraft on Friday, July 31. Are you on schedule for the first flight next March 31?*

AV: We're entering a very exciting part of the program. When the plane arrived, there was

Kicking The Tires. *On July 31, several hundred Grummanites gathered on the new taxiway at Melbourne Airport in Florida to check out the arrival of the Boeing E-3A. The plane is a military version of a 707-300 cargo plane, and will be one of two development planes that will take Joint STARS aloft. Said Melbourne Systems President Al Verderosa, 'When the plane arrived, there was a dramatic transformation from paper to product.'*

a dramatic transformation from paper to product. Now, you can go outside and kick the tires. You can see it in people's eyes; there is another surge in morale.

Right now, we are on track for the March 31 Early Engineering Flight Test (EEFT). The flight tests will get to the heart of the system — the radar. The tendency in flight test programs is to test the easy parts first. This time we're reversing the tables and testing the radar first. It takes its toll of course.

You'd hate to find out 10 months into the tests that a key part of the system like the radar has some fundamental problems that will take another eight months or so to correct. You've blown a lot of time. We are going to test the basic radar system to see if we can detect targets, steer the radar, track with synthetic aperture, and other functions. We are not going to test the entire spectrum, but enough to assure us that the radar works as designed.

'The schedule is very tight and ambitious.'

When we cross that threshold, then we can fine tune it.

GW: *What is the most difficult task in designing a system of this complexity?*

AV: Software system engineers have the toughest jobs on a program of this magnitude. These people must translate the system requirements into specifications. Software engineers then take the specs and write the codes in FORTRAN language. While there are many software engineers who can write the codes, the system engineers who design the architecture of the system are rare. They must understand the synergism between the systems. They take the general specs and then break them down. If the coders are using incorrect specs, then the system will not work.

GW: *Has the hardware been delivered from the subcontractors yet?*

AV: We will get the radar from Norden in December and other components are starting to arrive. The critical path right now is the delivery of the radar.

Of course, we are encountering the standard problems. Creation of something that doesn't exist always involves headaches. There is no historical data base to draw from. To invent you are at the mercy of inventors.

It's critical that we track everything from software to subcontract work to avionics. We have five control rooms dedicated to this task. You have to be able to figure out the ripple effect a late delivery or hardware failure will have on the master schedule.

I'm a firm believer that if you can't plan it and track it, you can't do it — especially with a program of this complexity. We track the dickens out of everything. I see no other way.

Forget about program milestones, you have to have program inchstones to the n-th degree right down to who is responsible for what. You always have to understand what your critical path is. Some things are the long poles in the tent. If they slip day to day, it can affect the whole program. However, there is slack for some of the shorter poles.

GW: *Do you call upon the expertise of other Grumman divisions?*

AV: Definitely. Divisionalization was never meant to be total autonomy. Someone described divisionalization this way: we want fences around the division, but split rail fences — not chain link.

Just about all the Grumman people we moved down here came from Aircraft Systems, so they're really the organization that provided most of our engineers and other type of support. Electronics Systems' Great River facility is building some $20 million worth of instrumentation, operator consoles, equipment racks, cabling and so on. St. Augustine and Stuart Operations have been very helpful in providing us with personnel for short-term assignments as well as other assistance. And, of course, we get a lot of help from our Washington office on budgetary and legislative affairs.

'If you have an ego, this job will humble you quickly.'

GW: *What are the major challenges facing the division this year?*

AV: By year's end, we have to get all the hardware from our subcontractors and continue to work on the software. Meanwhile, we must integrate our lab. We have taken great pains to see that the lab is an exact replica of the plane. It's so exact that even the cable lengths will be the same as on the aircraft. If it plays in the lab then it will play on the aircraft. We want to keep the differences to a minimum, and eliminate a lot of the unknown. That way we can reduce problems before we start flight testing the system.

GW: *Is it tough keeping morale high?*

AV: There is a lot of pressure on people. The nature of the job demands a lot of hours. People automatically work those hours without being asked. We hope, in time, that will ease up a bit. It's a tough level to sustain. But, right now I don't see the pressure subsiding for a while. It's just too complicated a program, too much of a challenge to be accomplished in a 40-hour week.

GW: *Is motivation a problem?*

AV: I wish I knew what it is that gets everybody so hyped on this program. They motivate themselves. You almost find the reverse; you have to de-motivate people and tell them "get out of here and go home." It's good, but burnout can occur. It's one thing to work crazy hours for five months on a proposal. Do it for the next five years and that's hard. You have to be very sensitive.

Team Spirit. *The first flight of the Joint STARS aircraft will be March 31, 1988. Grummanites at Melbourne Systems wear blue and white buttons with '3/31 Go For It' printed on them. Banners and posters with similar slogans are hung up all over the building. (Photos by Bob Settles)*

GW: *What is your management style?*

AV: I had to go through a transition which was not easy for me. I was always what I call a micro manager, a detail kind of guy. I never saw the big picture come back to bite anyone; it's always the details that bite you.

So I've always rolled up my sleeves and gotten involved in detail management and tracking engineering management. In this job, I can't do that, so I've had to turn all that over to Marty Dandridge. He's our program vice president and he's a detail nut, too.

I've delegated a lot more than I've ever done in this job. It's a little bit difficult. My job is to make sure the resources are there to do the job and get new business. That involves working the legislative arena with our folks in the Washington office, so that our own people don't have to be troubled with program funding. They can concentrate on the job at hand.

GW: *Your office in division headquarters is about a mile away from the Joint STARS building. Is that a problem?*

AV: You can easily become a slave to your desk. I don't like remote management style: my door is open, I'm in here if you need me. I'd rather be out talking to people. You always learn something you didn't know before. More than likely it's something dealing with a program problem. You can take a pulse of the work force by talking with people. Is morale high? Is it downbeat? Do they feel they are trying to do the impossible? You can't do that with status notes. There's no flavor there.

GW: *Is Joint STARS the toughest job you've had?*

AV: I've been in the trenches before while working with a lot of people now assigned to this program. And we thought those jobs were challenging and tough. But to me, they were not as tough as this job. If you have an ego, this job will humble you quickly. When we succeed, it will be euphoria.■

H.S. Class of '88 Invited To Compete For Scholarships

Applications for the 1988 Grumman Science and Engineering Scholarships are now available. Entry deadline is November 1.

For the 43rd year, this competitive program is open to Grumman dependents throughout the country who are high school seniors and who plan to attend a four-year college to pursue a science or engineering degree.

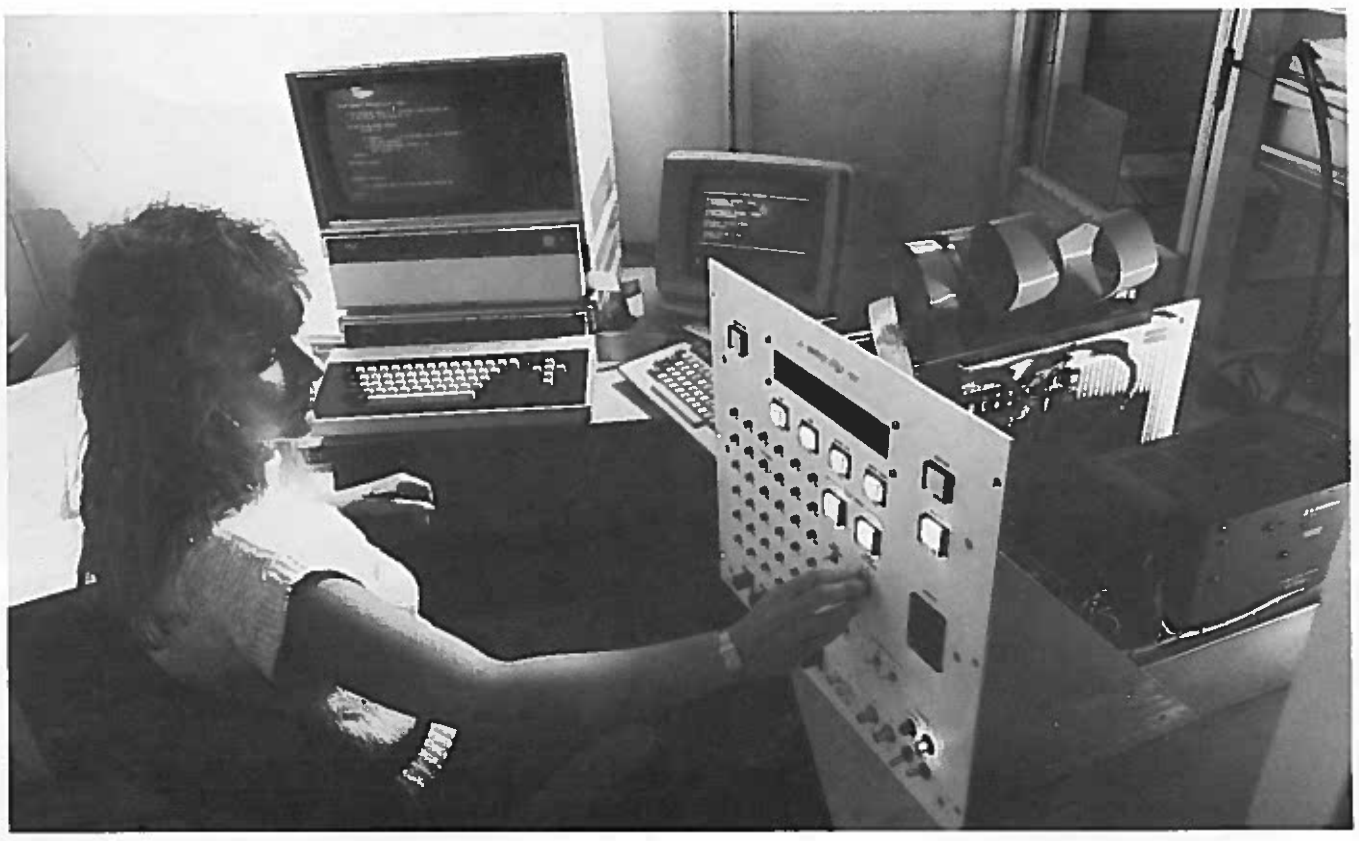
The Grumman parent must have two or more years of continuous service with the company. All Nassau and Suffolk high school seniors on Long Island can also compete.

The 12 scholarship winners each receive up to $6,000 per year for tuition. They are also offered summer jobs at Grumman and full time jobs upon graduation.

Long Island students can get applications from their school guidance offices.

For Grummanites working in off-Long Island sites, the applications are available at site administration offices.

For more information, call Sue Derienzo, Ext. (111) 52682.■



And At The Keyboard. *In the Engineering Department Hardware Development Lab in Great River, electronic design engineer Nancy Misucavech is checking out a new, mircroprocessor-based, test set using a Series 3 development system and in-circuit emulator. The test set is an advanced design developed by her group, Product Design Engineering. It is almost completely automatic and can check itself as well. Engineers at the lab use systems such as the development system, the emulator and this test set to bring concepts through to production-ready design. The lab even has an environmental chamber to test systems under the conditions they will face. (Photo by Rich Breunig)*

Several Divisions Announce New Appointments

The following Grummanites recently received new assignments:

Aerostructures

Product Operations-Louis Riedell, product operations program manager, C-17 Program; Lew Iuliucci, product operations program manager, Transcowl Program.

Aircraft Systems

Product Operations-Barry Wallace, assistant product operations program manager, F-14 Block 60/65 Program; Albert Victorino, assistant product operations program manager, F-14A+ Retrofit Program; Vincent Paolini, foreman, Major Assembly 002/046;

Technical Services-Patrick D. Ranieri, director of human resources.

Technical Operations-James Pavlica, group head, Fluid Power/Pyrotechnics; Vincent Devino, group head, Crew Systems/Equipment Integration; John Rockensies, project engineer, Vehicle Subsystem F-14; John T. DiLeva, operations project leader, A-6 Programs; Joseph Allison, project engineer, Avionics Design, E-2/C-2 Program; Walter Sidoruk, technical specialist, Human Engineering Factors; JoAnn Morgan, project manager, GEMS Applications.

Integrated Logistics Support-Howard Solof, project manager, Program Controls, EA-6.; Theo J. Monahos, technical specialist, Digital Test Program Sets Engineering, ILS Engineering; Kevin T. Sweeney, technical specialist, Test Program Sets Engineering, ILS Engineering; John A. Portuese, technical specialist, Digital Test Program Sets Engineering, ILS Engineering; Vincent A. Lavan, engineering specialist, RF/Analog TPS Engineering, ILS Engineering; Edward J. McCormick, technical specialist, RF/Analog Test Program Sets Engineering, ILS Engineering; Walter Link, project manager, Program Controls, E-2; Salvatore Attard, principal engineer, Mechanical Engineering, ILS Engineering; Charles Antonette, group head, RF/Controls, Equipment Design Engineering, ILS Engineering.

Bethpage Operations-Bernard Kurz, foreman, Electronics 14/033; William Keane, supervisor, Production 14/26; Giacinto Lanfranco, production manager, Building 03.

St. Augustine

Production-James Walker, supervisor, Inspection; John Lee, manager, Quality Inspection; Larry Mollica, leadworker, Diemaking & Tool Forming; John Teele, leadworker, Machine Shop.

Data Systems

Systems Support-William J. O'Neil, director of service operations, Maintenance Activities; John Ketcham, assistant director, Internal Services; Lawrence Lala, director, Technical Services; Joe Banaszewski, senior systems programmer, Grumman District; Claudia J. Betzner, assistant to the president; Phil Blum, supervisor, Grumman District; Larry Bosley, branch manager, Baltimore Office; Ken Butler, district manager, South Central District; Joe Coniker, branch manager, Long Island Service Operations; Alan Cook, associate maintenance engineer, Grumman District; Mark Cordaro, maintenance engineer, Grumman District; Ron Cusmano, maintenance engineer, Grumman District; Thomas Davis, director, Sales, Marketing Department; Ed Durante, branch manager, Philadelphia and Moorestown (So. New Jersey) Office; Julian Eargle, assistant manager, Washington-Gaithersburg; Kerry Farrell, national logistics manager, Service Operations; Ron Garland, branch manager, Los Angeles-San Diego; Larry Giugliano, branch manager, Long Island Telecommunications; Lisa Hedgepeth, senior maintenance technician, Grumman District; Douglas Hoffman, director of Contracts and Purchasing; Garry Hubbard, maintenance engineer, Grumman District; Jim Kinneman, manager, Support Service Planning; Sal Leone, supervisor, Grumman District; George McDuffie, branch manager, Gaithersburg; Charles Munzer, director of Federal Marketing, GSS; Bob St. Germain, manager, Market Planning, GSS; Mike Smith, branch manager, Richmond; Hugh Taylor, accounting manager, GSS; William Zeidler, supervisor, Woodbury Logistics.

Marketing Services and Communications-Frank Weghorn, assistant director, Communications.

Information Services and Operations-Paul C. Muzio, director, Special Systems and Systems Integrity.

NASA Engineering Analysis and Data System (EADS) Project-Monte T. Cunningham, program director.

Personnel and Administration-Karen McGill, associate building/department administrator for Huntsville, Alabama; Marshall Space Flight Center, Huntsville; Arnold Air Force Base, Tullahoma, Tennessee.■

Retirees

On behalf of our fellow workers, *Grumman World* salutes the following Grummanites for their contributions to the company and wishes them well in their retirement. Those who have recently retired are:

Edith M. Carpenter (77), Charles Coon (14), Clara M. Ebbecke (15), Howard Holland (52), Andrew P. Paterno (30), Charles Rogers (44), John W. Schneider Jr. (77), Thomas M. Walsh (GHQ), Robert S. Gent (1), Raymond Bromm (12), Jeanne M. Gentile (30), Jerry L. Schad (1), Joseph S. Pierro (237), Andrew F. DiMarco (30), Vito J. Linsalato (15), Aaron M. Caylor Jr. (20), Gerard F. Kehoe (30), Peter L. Treffeisen (44), Charles N. Talley (30), Joseph S. Canciglia (30), Joseph A. Congero (43), George J. Souhrada (5), Orlando B. Capodieci (43), Michael J. Joyce (1) Julius Cohen (GHQ), Charles A. Catalano (1), Shirley V. Catalano (2), Frank DelPizzo (GHQ), Howard J. Dobias (77), Harris L. Halperin (1), Stanley A. Crodski (12), George A. List (4), James R. Manfredi (110), Peter Sinkowsky (110), Paul P. Thiergardt (279), Vernon Cornell (6), Joseph D. Cassese (77), William T. Hardern (77), Lawrence Jesberger (43), Melvin Kolbert (35), Charles McGowran (43), Charles Rizzo (43), Carlo Ruggiero (3), Richard Waldmann (25), Francis Walton Jr. (77), Nicholas LaCascia (1), Joseph Adamo (6), Loretta Marshall (GHQ), John Masek (12), Ernst A. Abrahamsen (15), Joseph Lisa (35), William Caniano (43), George Adesso (44), Horst J. Fuhrmann (43), Eugene Doka (1), Robert Craig (1), Ray M. Lutz (237).

Let Grumman Pay Your Tuition

Grummanites are invited to participate in the company's Tuition Reimbursement program. This program reimburses you for your tuition outlay for college courses approved by Grumman, if you make the grade.

An A nets the recipient a 100 percent refund while B's earn 85 percent back and a C entitles the student to a 75 percent refund. Anything lower is not reimbursed.

This system requires an initial investment by the students. They lay out the money up front and then the company reimburses them when grades are in. You don't have to be pursuing a specific degree in order to be reimbursed.

Application forms are available in all Employee Services (ES) offices. For more information, contact your Personnel administrator or Lorraine Alfino at (516) 575-3734.■

Company Keeps Keen Sight On Eye Safety

Grumman isn't looking to put retail suppliers of eyeglasses out of business. But the company issues about 9,000 pairs of eyeglasses each year as part of its eye safety program.

Each day, thousands of Grummanites work in or visit eye hazard areas throughout the company where it is mandatory to wear protective eyewear. Without it a foreign body or chemical could get in your eyes and injure you.

"We don't mince words. You can lose some of your eyesight, go blind, or even die from an eye injury," says Jim Spencer, director of Industrial Safety and Hygiene. "The eye is an opening to the brain. We've been very fortunate that no Grummanite has ever lost an eye or been blinded on the job. However, one person lost some sight when a piece of a drill bit flew into his eye."

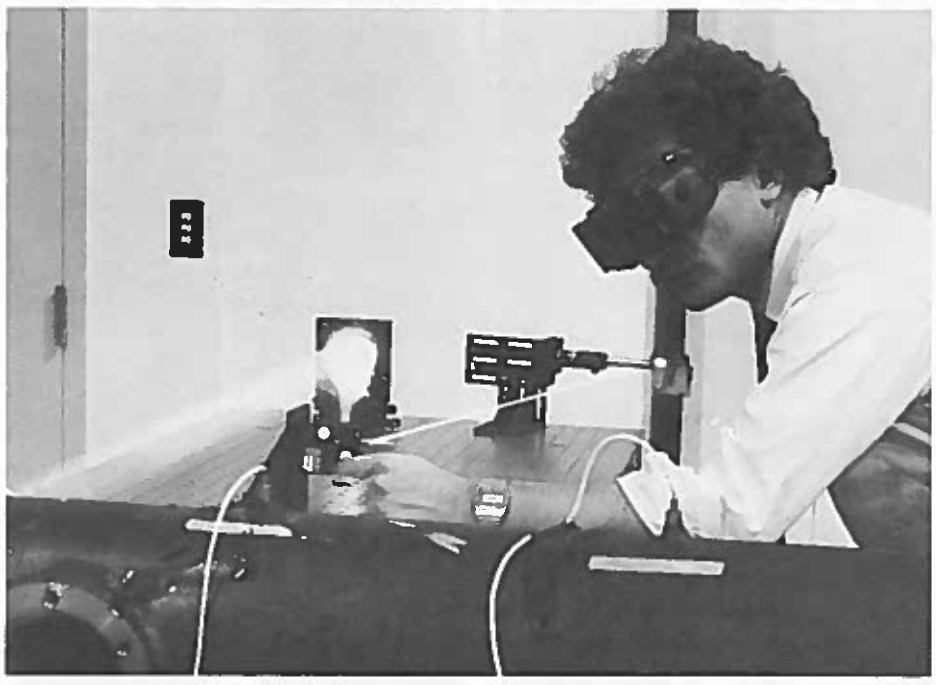
Six percent of Grumman's lost-time accidents in 1986 were due to eye injuries. So far in 1987, that has decreased to 5 percent. "While the percentage has gone down," says safety engineer Rae Nemovicher, "every injury is one too many for the person it happens to."

For protection, Grummanites may obtain eyeglasses with 3mm-thick safety lenses. Standard prescription lenses are 2mm thick and do not provide adequate protection from industrial eye hazards. In addition, safety lenses are beveled and the frame has an interior lip, preventing the lens from shattering inward.

Safety eyeglasses come in standard "Clark Kent" and fashion styles. Clark Kent glasses are issued free to people who work in eye hazard areas, provided they contain bifocals or distance lenses.

"We encourage people who need them to wear bifocals instead of obtaining two different pairs of glasses," explains optician Laura Guenther. "People in their 40s develop presbyopia — 'old eyes' — and need separate lenses for seeing distances and close-up objects. We don't want people in an eye hazard area to be changing their glasses."

As far as style is concerned, those in eye hazard areas can obtain two pairs of safety glasses a year — provided one pair is the standard variety. There is a nominal charge for the fashion frames. People in non-hazard areas can obtain only one pair and the fee ranges from $18 to $30.



Safety Shades. *In Grumman's Corporate Research Center, research scientist Elias Panides wears special goggles while conducting an experiment with lasers.*

If you work in an eye hazard area and have 20/20 vision, you are issued non-prescription plano glasses with clear lenses. These should never be worn over contact lenses, which are banned in eye hazard areas. Dust and dirt can lodge behind the lenses, causing severe irritation. Chemicals can react with the material in plastic contact lenses, causing them to bond to your eyeballs. In severe cases surgery is required and corneal damage may result.

Opticians only dispense and adjust eyeglasses and check them for proper strength. For an eye exam, you must go to an optometrist or an ophthalmologist on your own. Grummanites on Long Island can bring their prescriptions to the opticians during the hours listed (see box). Off Long Island, a safety rep or nurse can arrange an appointment with an optician.

There is a good selection of both metal and plastic frames to choose from. "However, there are no rimless styles because those can't function as safety frames," says Guenther. "Nor do we provide half glasses or multifocal lenses, which are like bifocals without the lines and are very expensive."

A Grummanite may choose between glass and scratch-resistant plastic lenses. The opticians prefer plastic because they get a lot of complaints about glass lenses' weight and slippage. They also offer a tint called sand, which can help reduce eyestrain. However, you cannot obtain photo sensitive lenses or sunglasses.

In some areas, Grumman relies on more stringent eye safety measures, including chemical splash goggles, face shields, heat deflecting visors, and laser glasses.

The use of lasers has become much more widespread in industry. For instance, some construction firms now use laser beams to level ceiling tiles. There are five classes of lasers, ranging from the harmless to those requiring stringent safety precautions. Different color goggles block out different wavelengths of lasers, and side shields are required for the most hazardous lasers.

The Safety department freqently fields questions about computer terminals. However, there has been no proof that terminals pose eye hazards. Glare and eyestrain are the main complaints, but people can usually solve these problems by using special anti-glare screens, correct lighting and by breaking up time at the terminal with other work. In order for the optician to make eyeglasses for computer use, the employee must obtain a prescription for that working distance from his or her eye doctor.

A company-wide disciplinary procedure applies to those caught without correct eyewear. The first time, you will get a verbal warning, and the second, a written one. The third incident will get you suspended without pay, and you will be fired on the fourth occasion.

The company also has a program that recognizes those who do protect themselves. It is called the Wise Owl Club and is co-sponsored by the American Society for the Prevention of Blindness. Members of this elite club all know the importance of wearing eye protection: they have had accidents while they were wearing safety glasses, and were protected by them. So far, 107 Grummanites have become members since it began in 1950.

Industrial Safety and Hygiene has a wide variety of books, films, videos and other materials about eye safety. For more information, contact the department on Ext. (111) 53193, (516) 575-3193.■

A Fitting Occasion

Opticians are available for services in Long Island buildings on the following days and times.

Bldg. 1: Monday and Wednesday, 10:30-11:30 a.m.; Tuesday, 5:30-6:30 p.m.
Bldg. 2: Monday through Friday, 8-10 a.m. and 1:30-2:30 p.m.; Tuesday, 5-5:30 p.m.
Bldg. 3: Monday, Wednesday, 10:30-11:30 a.m.; Tuesday, 6:15-7 p.m.
Bldg. 5: Tuesday and Thursday, 10:30-11:30 a.m.
Melville: Bldg. 40, first and third Tuesday of each month; Bldg. 110, second and fourth Tuesday; Bldg. 9, first Thursday. All 1:30-3:30 p.m.
Great River Bldg. 43: Wednesday 1:30-4:30 p.m.
Calverton Bldg. 6: Friday, 8 a.m.-4 p.m.

Close Work. *Grumman optician Nino Syracuse checks a pair of eyeglasses on a lensometer. Grumman issues 9,000 pairs of safety glasses a year. (Photos by Marie Trimborn)*

W. M. Allen

J. L. Bernstein

E. L. Blumberg

L. R. Brandt

A. Caracciola

P. P. Cassese Jr.

K. J. Clausey

C. G. Collier

J. J. Conlan

T. R. Cook

R. J. Craven Jr.

R. DiCostanzo

E. DiFabio

R. F. Feser

H. Foglino

G. Friedenreich

Service Milestones

50

Edward G. Carranza, Bethpage, Aircraft Systems

40

Leonard F. Bosshammer Sr., Bethpage, Aircraft Systems
Perry A. Emeigh, Bethpage, Aircraft Systems
James Flood, Melbourne, Melbourne Systems
Joseph G. Kirchdorfer, Bethpage, Aircraft Systems
James S. Lacy, Bethpage, Aircraft Systems
Richard A. Mazourek, Calverton, Aircraft Systems
George M. McNally, Huntington Beach, Aircraft Systems
Edward Miron, Bethpage, Aircraft Systems
Edward Sweezy, Bethpage, Corporate Services
Edgar A. VanBuren, Calverton, Aircraft Systems
Paul A. VonBernewitz, Bethpage, Aircraft Systems
Francis Zarodkiewicz, Bethpage, Aircraft Systems

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Walter H. Aims Jr., Bethpage, Aircraft Systems
Norbert J. Alberts, Bethpage, Aircraft Systems
Alfred W. Blunt, Calverton, Aircraft Systems
Edward Brady, Calverton, Aircraft Systems
Ronald Christiansen, Calverton, Aircraft Systems
Salvatore Conforti, Pt. Mugu, Aircraft Systems
Francis P. DeQuarto, Calverton, Aircraft Systems
Thomas L. Garite, Bethpage, Aircraft Systems
John F. Groh, Calverton, Aircraft Systems
Theodore E. Haeberle, Bethpage, Aircraft Systems
Edward R. Kirschberg, Great River, Electronics Systems
Martin J. Lieblang, Bethpage, Aircraft Systems
Eldredge McCready, Milledgeville, Aircraft Systems
Henry Meder, Bethpage, Aircraft Systems
Frank A. Miller, Bethpage, Aircraft Systems
William A. Moore, Pt. Mugu, Aircraft Systems
Joseph V. Neary, Bethpage, Aircraft Systems
George C. Nichols, Calverton, Aircraft Systems
Charles N. Rizzo, Great River, Electronics Systems
William F. Rosenburg, Bethpage, Aircraft Systems
Raymond B. Ryan, Stuart, Aircraft Systems
Julius A. Schaad Jr., Bethpage, Aircraft Systems
Arthur H. Spear Jr., Calverton, Aircraft Systems
Friedrich L. Steinmetz, Melville, Aircraft Systems
William C. Trillo, Bethpage, Aircraft Systems
Albert G. Turnquist, Great River, Electronics Systems
Isaac Washington, Bethpage, Aircraft Systems
George A. Waugh, Calverton, Aircraft Systems

30

Joseph A. Abbatiello, Bethpage, Aircraft Systems
Bruno Apollonio, Bethpage, Aircraft Systems
Michael T. Bergin, Bethpage, Aircraft Systems
Warren C. Bowers, Great River, Electronics Systems

H. Gollatz

F. W. Gross

I. Hyman

S. J. Kish

R. L. Klussman

P. H. Kuch

Edward F. Burkhardt, Bethpage, Data Systems
Arthur Campbell, Hicksville, Aircraft Systems
Ronald E. Cerank, Melville, Aircraft Systems
John F. Cowan, Great River, Electronics Systems
Eugene D'Andria, Bethpage, Aircraft Systems
Charles A. Elserman, Bethpage, Aircraft Systems
Manuel Encizo Jr., Bethpage, Aircraft Systems
Robert Koppenhoefer, Great River, Electronics Systems
Michael G. Kornely Jr., Bethpage, Aircraft Systems
Frederick J. Lambui, Bethpage, Aircraft Systems
Richard M. Landers, Marathon, Allied
Michael Larkin, Bethpage, Aircraft Systems
George L. Matthews, Calverton, Aircraft Systems
Arthur E. Quimby Jr., Bethpage, Aircraft Systems
Francis J. Radocy, Bethpage, Aircraft Systems
Robert T. Reilly, Calverton, Aircraft Systems
Henry R. Riehl, Melville, Aircraft Systems
Joseph Russo, Bethpage, Aircraft Systems
William R. Stratton, Bethpage, Aircraft Systems
Walter Tully, Bethpage, Aircraft Systems

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William M. Allen Jr., Calverton, Aircraft Systems
Harvey I. Beringhause, Bethpage, Aircraft Systems
Joel L. Bernstein, Melville, Aircraft Systems
Edward L. Blumberg, Bethpage, Aircraft Systems
Richard L. Bocchicchio, Bethpage, Aircraft Systems
Lee R. Brandt, Milledgeville, Aircraft Systems
Henry Buchanan Jr., Bethpage, Aircraft Systems
Thomas S. Burtis, Glen Arm, Aircraft Systems
Robert E. Bynoe, Bethpage, Corporate Services
Anthony D. Caracciolo, Bethpage, Aircraft Systems
Peter P. Cassese Jr., Bethpage, Aircraft Systems
Peter J. Cenotti, Calverton, Aircraft Systems
Kenneth J. Clausey, Great River, Electronics Systems
Clifford G. Collier, Stuart, Aircraft Systems
Joseph J. Conlan, Bethpage, Corporate Services
Timothy R. Cook, Milledgeville, Aircraft Systems
Robert J. Craven Jr., Bethpage, Aircraft Systems
Rocco DiCostanzo, Bethpage, Aircraft Systems
Eugene DiFabio, Great River, Electronics Systems
Allan Donley, Bethpage, Corporate Services
Harvey L. Eidinoff, Melville, Aircraft Systems
Rolfe F. Feser, Glen Arm, Aircraft Systems
Henry Foglino, Melville, Aircraft Systems
Gilbert Friedenreich, Bethpage, Aircraft Systems
Harold Gollatz, Bethpage, Aircraft Systems
Frederick W. Gross, Bethpage, Aircraft Systems
Irwin Hyman, Bethpage, Aircraft Systems
Stephen J. Kish, Bethpage, Aircraft Systems
Robert L. Klussman, Bethpage, Aircraft Systems
Paul H. Kuch, Great River, Electronics Systems
Alfred K. Larsen, Bethpage, Aircraft Systems
Harold D. Lee, Holtsville, Data Systems
Stephen A. Leoniak, Calverton, Aircraft Systems
Allen J. McCaffery Jr., St. Augustine, St. Augustine
Francis Molnar, Bethpage, Aircraft Systems
Andrew Nykolyn, Bethpage, Aircraft Systems
Fred Poole, Bethpage, Aircraft Systems

A. K. Larsen

H. D. Lee

S. A. Leoniak

A. J. McCaffery Jr.

F. Molnar

A. Nykolyn

F. Poole

R. H. Pravednekow

R. C. Scherrer

F. R. Spinos

G. A. VanEssendelft

Richard H. Pravednekow, Bethpage, Corporate Services
Richard C. Scherrer, Stuart, Aircraft Systems
Frank R. Spinos, Paris, Aircraft Systems
Kurt K. Treptow, Calverton, Aircraft Systems
Gerald A. VanEssendelft, Calverton, Aircraft Systems

GDS Institute Holds Seminars

Grumman Data Systems Institute is offering IBM personal computer software and CADD (computer-aided design and drafting) seminars throughout 1987.

Grummanites can receive a special discount on tuition for these seminars. For more information, call the Institute's Admission Department, 364-2055 in Nassau; 467-6690 in Suffolk.

Fall Cleaning

The Grumman Security Department urges employees to properly discard any documents that are no longer needed. Burn barrels are provided in the plants for that purpose.

If you think you have unclassified documents that may be of some historical significance, call Lois Lovisolo, Ext. (111) 52401, at the History Center to see if there is a copy of the document on file before it is discarded.

Next Edition: October 9

New Postal Drug Store Draws Large Following

Thousands of Grumman employees and retirees are taking advantage of the Mail Service Prescription Drug Program for their maintenance drug needs.

Starting this year, employees and their dependents can use the program if they are currently eligible for prescription drug benefits under the Major Medical portion of the Grumman/Travelers Group Health Insurance Plan. Members of HMOs are not eligible for this program.

Since April 1986, all Grumman retirees covered by Grumman/ Travelers' Major Medical have been eligible for the mail service prescription. There is no fee for retirees, while employees and dependents pay a nominal $2 fee per prescription.

"The program is designed for people who take prescription drugs on an ongoing basis," says Mary Kaye Cronin, manager of Insurance Benefits. "A lot of people use the program to obtain maintenance drugs such as heart, blood pressure, allergy and acne medicines." People are encouraged to use generic drugs whenever possible.

You can receive up to a 180-day supply of medication; there are no claim forms to file and no waiting for reimbursement. There are no deductibles to satisfy before using the program. The drugs are mailed directly to your home, postage paid.

During June and July of this year, over 10,900 prescriptions were filled; generally the monthly figures are split evenly between retirees and employees.

Mail Service Prescription Drug Program forms are available in all Employee Services offices. A complete description of the program and its procedure is featured on the form. National Pharmacies' Customer Service Department is open Monday through Friday, from 9 a.m. to 5 p.m. (EST). Its toll free number is 1-800-631-7780.

Here are answers to some common questions asked about the program.

How To Use The Program

Ask your physician to prescribe needed medications for up to a 180-day supply — plus refills. If you are presently taking medication, ask your doctor for a new prescription.

Patient Profile Questionnaire forms must accompany your first order only. These forms are available in all Employee Services offices. Be sure to answer all the questions, for yourself and your eligible dependents and make certain you include your Social Security number on the form.

Send the completed Patient Profile Questionnaire, your original prescription(s), and $2 for each prescription to National Pharmacies, using the attached reply envelope.

National Pharmacies will process your order and return it to you via First Class or UPS, along with instructions for future prescriptions and/or refills. Allow up to 14 days for delivery.

How To Get Refills

With your original prescription medication, you will receive a notice showing the number of times it may be refilled. Simply mail this refill notice and $2 to National Pharmacies in the pre-addressed order envelope which comes with your first order. To avoid the risk of running out, order your refills two weeks before you need them.

What About Emergency Situations?

There will be times when you need a prescription immediately. On these occasions, you should have your prescription filled at a local pharmacy and submit it for reimbursement under the Grumman/Travelers plan. If you need medication immediately but will be taking it on an ongoing basis, ask your doctor for two prescriptions: the first should be for a 14-day supply that you can have filled at your local pharmacy; the second prescription should be for the balance, up to a 180-day supply. Send the larger prescription along with $2 immediately to National Pharmacies.

How To Receive A 180-day Supply

Your doctor must prescribe a 180-day supply for you to receive that quantity. For example, if you take one tablet per day your doctor must write a prescription for 180 tablets. If you take two tablets per day, your doctor must write a prescription for 360 tablets. The law requires that pharmacies dispense the exact quantity prescribed by the physician. If your doctor authorizes refills, they can only be dispensed when your initial order has nearly expired.

Note: Certain prescribed medications may be subject to other dispensing limitations and to the professional judgment of the pharmacist.■

Obituaries

Leroy Duryea of Field Engineering, Cubi Point, Philippines, Technical Services Division, died June 23 at the age of 54. He had been with the company since 1957 and resided at 96 Andreano Ave., East Patchogue, N.Y.

Richard E. Merrifield of Technical Requirements, Melville, Aircraft Systems Division, died August 27 at the age of 57. He had been with the company since 1967 and resided at 300 North Michigan Ave., Massapequa, N.Y.

Rudolph W. Werns of Electric Fabrication, Calverton, Aircraft Systems Division, died August 26 at the age of 48. He had been with the company since 1963 and resided at 40 Fairlane Dr., Selden, N.Y.

Retiree Obituaries

Herman Colter of 97 Maple Pl., Freeport, N.Y., died August 28, 1987. He retired in 1967.

Stanley Mruz of 10 Switzerland Rd., Hicksville, N.Y., died August 28, 1987. He retired in 1977.

Alice I. Saari of 2814 N. Torpedo Rd., Oak Harbor, Washington, died August 24, 1987. She retired in 1983.

Christopher Stiefvater of 7 Norwalk La., Selden, N.Y., died September 2, 1987. He retired in 1984.

Readership Survey

We don't want to do all the talking. We'd like to know what you think about the things you see in these pages. Your comments, suggestions and complaints are welcomed. Please take a few minutes and give us your opinions.

Article	Great	Good	Poor	Didn't Read
Airship (Pg. 1)	☐	☐	☐	☐
EIP Checks (Pg. 2)	☐	☐	☐	☐
Spin Recovery (Pg. 3)	☐	☐	☐	☐
Systems Support (Pg. 4)	☐	☐	☐	☐
V-22 (Pg. 5)	☐	☐	☐	☐
Verderosa (Pg. 6)	☐	☐	☐	☐
Eye Safety (Pg. 9)	☐	☐	☐	☐
Chairman's Letter	☐	☐	☐	☐

Suggestions For Future Articles:.....

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Name .....

(Required If You Wish A Reply) **Ext.**.....

☐ Retiree **Division**.....

Mail to: Grumman World, A22-GHQ
1111 Stewart Ave., Bethpage, N.Y. 11714

New Appointments Made In Product Operations

In recent months, the Aircraft Systems Division announced the realignment of Product Operations and along with it, a number of new appointments. Included in those appointments were the following:

As Vice President-Production Operations, *Vinny DeStefano* is responsible for all Aircraft Systems Division sites which produce Grumman products. These sites include Stuart, Florida; Milledgeville, Georgia; Bethpage, N.Y. (Bldgs. 1, 2, 4, 14 and 26 Tool Fab & Control); Parts Fabrication in Bldgs. 3 and 56; and Calverton, N.Y.

Robert Carri, director of Manufacturing Technology Operations, is responsible for current and advanced manufacturing engineering support for all Product Operations.

The vice president of Program Management is *Bill Trillo*. His area interfaces with each of the Aircraft Systems Division sites and all divisional program offices utilizing these sites.

As director of Material Operations, *Tom Harding* is responsible for establishing material requirements and status, distribution, receiving, shipping and storage.

Norm Reinertsen is vice president of Quality Operations. He is responsible for assuring the quality of all Aircraft Systems products, as well as the quality awareness programs. In addition, he is also in charge of Technology Development Programs.

Gary Scholl is director of Procurement Operations. He is responsible for all procurement activities within the Aircraft Systems Division.

Herb Grossman is vice president-Special Projects. Located in Building 5 in Bethpage, Special Projects is involved in developing and building demonstration hardware, prototypes and mockups.

James McDonagh is director of Business Operations and is responsible for the planning and status of business functions in Product Operations.

All report to Senior Vice President-Product Operations Tom McGrath.

Several other Grummanites received new assignments as a result of the realignment:

Business Operations

Norbert Hansen, director, New Business.

Manufacturing Technology Ops.

William Lamberta, director, Manufacturing & Materials Engineering; Ronald Heitzmann, director, Advanced Technology; and Robert Thomas Jr., director, Industrial Management.

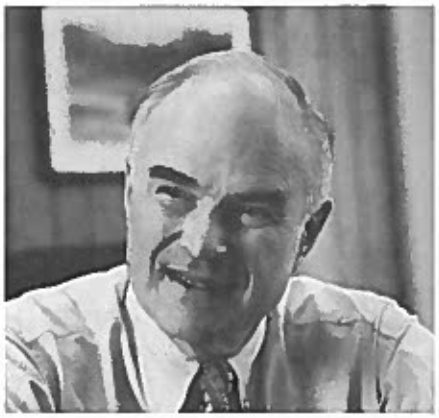
Production Operations

Vincent Ciampa, general manager, Parts Fabrication Operations; Robert Byrnes, general manager, Bethpage Operations; and Roy Montana, general manager, Calverton Operations.

Program Management

Harold Pabst, director, Product Operations; Henry Hauser, manager, MM&E Program Management; Michael Di Noia, manager, Business Management; Joseph Ivers, manager, Program Planning and Scheduling.■

A Letter From The Chairman



Summer's over; the kids are all back in school. Although it slows down the ride to work when you're following a school bus that starts and stops for miles, it's kind of fun to watch them all — the first graders with their cartoon lunch boxes, the older kids with identities that change with their outfits. As you watch them heading off for school, you have to wonder what they'll learn when they get there. When they climb off the school bus for the last time, ready for college or a first job, the thought persists: "How well prepared will they be?"

The *Washington Post* last month reported on a survey of 8,000 17-year-olds, conducted by the National Endowment for the Humanities. The results of the survey weren't reassuring. Sixty-eight percent of the students couldn't place the Civil War within the correct half-century; nearly a third thought that Columbus discovered the New World after 1750. Sixty percent couldn't identify Walt Whitman as the poet who wrote "Leaves of Grass."

It has been reported elsewhere that 30 percent of U.S. students will not graduate from high school. All of this, in spite of the fact that our country spends an average of $3,800 per year to educate each child.

This makes all of us worry about our nation's future, and about the happiness and well-being of our children. Industry, especially the high technology segment, worries about finding well educated, well trained people to maintain an effective work force.

Over the years, Grumman has shown its commitment to education in a number of ways: through scholarships, fellowships, and matching employees' gifts to colleges and universities. Most recently, the company started a cooperative program that sends Grumman engineers to talk to high school students about careers in high technology. Grumman also works with those schools in setting up appropriate curricula.

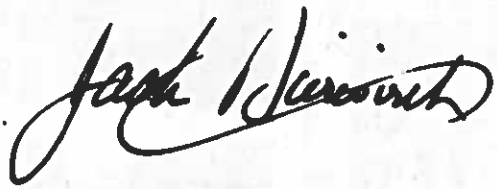
But perhaps the most important contributions are made by Grumman people working with the schools their children attend. Many Grummanites serve on school boards and belong to parent-teacher associations. On a more immediate level, they make sure that homework gets done; that their kids pick the right courses; that the seventh grade trip to the museum has enough parent volunteers. Once in a while, they even put in a weekend building papier-mache maps of South America.

But education is a lifelong process. Far more than the average, Grumman people go back to school. There are adult ed classes in our communities that are quite inexpensive; there are courses after work at many Grumman sites that are free. The Grumman offerings include computer programming, basic electronics, business writing, public speaking, and more.

One of our most significant employee benefits, the tuition reimbursement program, helped 2,200 Grummanites last year to enhance their skills and enrich their lives. If a college course relates to your job at Grumman, or to an area important to Grumman's business, chances are good that it is reimbursable — and the better your grade, the more money you can get back. Because of our work in the Far East on a variety of programs, Grummanites in certain disciplines will be offered the chance to learn Chinese and Japanese. We'll be announcing more about this in upcoming weeks. The rules for tuition reimbursement vary from division to division, but all of them have programs to help you go back to school.

Just since 1981, our spending in this area has grown from $450,000 to over $2 million per year. Even when our finances are tight, as they are now, advanced education has seemed like an especially sensible way to invest Grumman's money.

Next time you see a big yellow school bus, give some thought to getting some pencils, books and assignment pads of your own. You'll be making an important investment in yourself.



John C. Bierwirth
Chairman

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GrummanWorld
September 25, 1987

(Photo by Rich Breunig)

Fit To A Tee

Russell Hamilton of the Hydraulics/Cryogenics Department in the Aircraft Systems Division is attaching a Cryofit Tee, which joins hydraulic lines of the F-14 together. Using liquid nitrogen to expand the Tee's opening allows the line to be inserted. The clamp connector that holds the Tee and the line together is also expanded with liquid nitrogen. At room temperature, the Tee and the connector contract around the hydraulic line creating a tightly fitted sub-assembly.